

RECENT PAPERS BEARING ON METEOROLOGY.

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The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers and other communications bearing on meteorology and cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled. It shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau.

Aeronautics. London. v. 7. March, 1914.

Gulls and eddies. p. 82.

American geographical society. Bulletin. New York. v. 46. February, 1914.

Condra, G[eorge] E[veret], & Loveland, G[eorge] A. The Iowa-Nebraska tornadoes of Easter Sunday 1913. p. 100-107.

Ward, Robert De C. A note on the classification of climates. p. 108-116.

Engineering news. New York. v. 71. 1914.

Snowfalls and street cleaning. p. 471. (Feb. 26.)

Temperature measurements on a concrete building. p. 606-607. (Mar. 19.)

Geographical journal. London. v. 43. February, 1914.

Gregory, J. W. Is the earth drying up? p. 293-318. [Bibliography, p. 308-313.]

International institute of agriculture. Bureau of agricultural intelligence and plant diseases. Monthly bulletin. Rome. 5th year. February, 1914.

Livingston, B. E., & Livingston, G. J. Temperature coefficients in plant geography and climatology. p. 191. [Abstract from Botanical gazette.]

Nature. London. v. 92. 1914.

Antarctic problems. The problem of the antarctic Andes and the antarctic horst. p. 700-702. (Feb. 19.) [Includes discussion of meteorological problems.]

Mallock, A. Weather forecasts in England, p. 711-712. (Feb. 26.) [An unfavorable criticism of weather forecasts in general.]

S[haw], W. N. Daily synoptic charts of the northern hemisphere and absolute units. p. 715-716. (Feb. 26.)

Bemmelen, W. van. Remarkable upper-air records at Batavia. p. 5-6. (Mar. 5.)

Braak, C[ornelis]. The vertical temperature distribution in the atmosphere. p. 6-7. (Mar. 5.)

Physical review. Lancaster, Pa. 2 ser. v. 3. January, 1914.

Miller, Eric R. Evidence of a diurnally reversing convectional circulation of the atmosphere over the upper peninsula of Michigan. p. 62-63.

Popular science monthly. New York. v. 84. April, 1914.

Lee, Frederic S. Fresh air. p. 313-329.

Royal meteorological society. Quarterly journal. London. v. 40. January, 1914.

Dines, W[illiam] H[enry]. The daily temperature change at great heights. p. 1-11.

Harries, Henry. Eddy winds of Gibraltar. p. 13-32.

Mossman, R[obert] C., & Salter, Carle. Great rainstorm at Doncaster on September 17, 1913. p. 33-42.

Church, J. E., Jr. Recent studies of snow in the United States. p. 43-52.

Brooks, Charles E. P. The meteorological conditions of an ice-sheet and their bearing on the desiccation of the globe. p. 53-70.

Bruce, Eric Stuart. Curious mirage of the sun seen at Ostend, September, 1907. p. 73.

Science. New York. v. 39. March, 1914.

Abbot, C[harles] G[reeley]. The solar constant of radiation. p. 335-348.

Scientific American. New York. v. 110. 1914.

Edholm, C. L. How's the weather up there? p. 183. (Feb. 28.) [Popular account of sounding-balloon observations made at Avalon, Calif.]

Waterspouts. p. 193. (Mar. 7.)

Economy in the Philippine weather bureau. p. 194. (Mar. 7.)

McAdie, Alexander. The storm of March 1st, 1914, measured in new units. p. 238. (Mar. 14.)

Scientific American supplement. New York. v. 77. February 28, 1914.

Optical marvels in the Antarctic. Light-pillars, coronas, auroras and mirages that greet the southern explorer. p. 132.

U. S. office of experiment stations. *Experiment station record. Washington. January, 1914.*

Dumas, L. Rain and its measurement. p. 17.

Kroll, G. H. Wind and the plant world. p. 30. [Abstract.] *Académie des sciences. Comptes rendus. Paris. tome 158. 2 mars 1914.*Boutaric, A. Sur l'état thermique de l'atmosphère. p. 652-655. *Cosmos. Paris. 63 année. 1914.*

Les résultats des niagaras paragréles. p. 114. (29 jan.) [Failure of electric niagaras in the Nantais region.]

Nodon, A. Description d'un baromètre et d'un thermomètre datant de deux siècles. p. 131-132. (29 jan.)

La lutte contre la grêle. p. 226. (26. fév.) [Abstract of address by Angot.]

Radium. Paris. tome 2. Janvier 1914.

Boutaric, A. Sur une relation entre l'absorption de l'atmosphère et la proportion de lumière polarisée contenue dans la lumière diffusée par le ciel. p. 15-26.

Société météorologique de France. Annuaire. Paris. 62 année. Janvier 1914.

Gèze, J. B. L'humidité du sol et la météorologie agricole. p. 12-17.

Goutureau, Ch[arles]. Sur les températures supérieures ou inférieures à certaines limites. p. 18-21.

Deutsche physikalische Gesellschaft. Verhandlungen. Braunschweig. Jahrgang 15. 1913.

Lutze, G. Zusammenhang der Störungen des atmosphärischen Potentialgefälles mit den luftelektrischen Empfangsstörungen der drahtlosen Telegraphie, nach Untersuchungen am Boden und im Freiballon. p. 1100-1106. (Nr. 21.)

Kohlhöster, Werner. Messungen der durchdringenden Strahlung im Freiballon in grösseren Höhen. p. 1111-1116. (Nr. 21.)

Everling, E. Beobachtung und Theorie der durch Reflexion erzeugten Lichtsäulen. p. 1117-1119. (Nr. 21.)

Neesen, F[riedrich]. Versuche der Zentralstelle für wissenschaftliche Untersuchungen in Neu-Babelsberg über die Blitzschutzaufrichtungen für Sprengstoffanlagen. p. 1173-1180. (Nr. 22.)

Himmel und Erde. Berlin. Jahrgang 26. Februar 1914.

Hellmann, G[uustav]. Über Wetterbergläuben. p. 193-202.

K. Akademie der Wissenschaften. *Sitzungsberichte. Wien. 122. Band. 1913.*

Kerner v. Marilaun. Synthèse der morphogenen Winterklima Europas zur Tertiärzeit. p. 233-298. (Feb.)

Dietzius, Robert. Die Variabilität der Steiggeschwindigkeit von Registrier- und Pilotballonen. p. 543-605. (März.)

Schmidt, Wilhelm. Luftwagen im Gebirgstal; nach Variographenaufzeichnungen von Innsbruck. p. 835-911. (Mai.)

Exner, Felix M. Über monatliche Witterungsanomalien auf der nördlichen Erdhälfte im Winter. p. 1165-1240. (Juni.)

Meteorologische Zeitschrift. Braunschweig. Band 31. Februar 1914.

Maurer, J., & Dorno, C. Über den Verlauf und die geographische Verbreitung der atmosphärisch-optischen Störung 1912-1913. p. 49-62.

Hann, J[ulius] v. Dr. G. C. Simpson: Einige Ergebnisse der meteorologischen Beobachtungen der zweiten antarktischen Expedition von Kapitän R. F. Scott. p. 62-67. [Includes data from other expeditions.]

Schmauss, A[ugust]. Ein von der Substratosphäre aus erfolgender Kälteeinbruch. p. 67-75.

Köppen, W[ladimir], & Wedemeyer, F. Beziehungen zwischen Temperatur, Luftdruck und Höhe der Troposphäre im europäischen Flachlande. p. 75-87.

Mazelle, Ed[uard]. Westbō und Springflut in Triest. p. 87-89.

Gold, E[rnest]. Atmosphärische Strahlung. p. 89-90.

Süring, R[einhard]. Merkwürdige Blitzwirkung. p. 90-91.

Henry, Alfred J. Vertikale Temperaturgradienten zwischen Mount Weather (Va.) und den Talstationen. p. 92-93.

Naturwissenschaften. Berlin. 2. Jahrgang. 1914.

Pütter, A[ugust]. Die Ausnutzung der Sonnenstrahlung durch die grünen Pflanzen. p. 169-175. (20 Feb.)

Eckhardt, Wilh[elm]. Über Grundlagen und Theorien der Paläoklimatologie. p. 193-196. (27. Feb.)

Richter, Wilhelm. Über Frost- und Schneefreie Zeiten im deutschen Reiche. p. 196-199. (27. Feb.)

Physikalische Zeitschrift. Leipzig. 15. Jahrgang. 15. Februar. 1914.

Simpson, G[eorge] C. Über die Elektrizität der Niederschläge. p. 213-215.

Weltall. Berlin. 14. Jahrgang. 1. Januarheft. 1914.

Kohlhöster, W. Radioaktive Substanzen und durchdringende Strahlung in der Atmosphäre. p. 97-102; 118-122. (1. u. 2. Jan.-H.)

Wetter. Berlin. 31. Jahrgang. Februar 1914.

Lindermann, [Carl.] Die mittlere täglichen Temperaturschwankungen nach den Terminbeobachtungen an zehn Stationen des Königreiches Sachsen. p. 25-28.

Müller, A. v. Klimavergleiche einiger meteorologisch interessanten Orte von Zentral-Europa. p. 28-32.

Götz, J. Über eine merkwürdige Form von Hagelschlossen. p. 43-45.

Der Februar in Aussprüchen der ländlichen Bevölkerung. p. 48.

Zeitschrift für Balneologie. Berlin. 6. Jahrgang. 15. Februar 1914.

Hellmann, G[ustav.] Über Wetteraberglauben. p. 631-637.

R. Accademia dei Lincei. *Atti. Roma. v. 23. 1914.*

Tosi, A. Dispositivo herziano per osservazioni meteorologiche e previsioni di temporali. p. 84-88. (18 gen.)

Monti, V[irgilio]. Sulla distribuzione mensile della frequenza relativa della neve nelle Alpi settentrionali. p. 151-154. (1 febb.)

NOTES FROM THE WEATHER BUREAU LIBRARY.

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RETROSPECTIVE.

In glancing back over the lustrum that has elapsed since these notes were interrupted, one is impressed by the facts that (1) there has appeared no great new trend of activity in meteorological research, comparable to the birth of aerology, as a coherent branch of science, which made the opening decade of the present century forever memorable in the history of meteorology; and that (2) the development of aerology has engrossed a major share of attention. The year 1909 was marked by the matured Humphreys-Gold explanation of what a few years ago was generally called the "isothermal layer," but is now almost universally known as the "stratosphere." The inappropriateness of the former name is illustrated by the record of a sounding balloon sent up from Batavia in December of last year. At the bottom of the stratosphere, 10.2 miles above the earth, was found the amazingly low temperature (1) of -90.9° C. (-131.6° F.), while above that level the temperature steadily rose to -57.1° C. (-70.8° F.) at the maximum altitude reached by the balloon, viz., 16.2 miles. This strong gradient is inconsistent with the idea of "isothermality."

A task still in progress is the determination of the relations between conditions aloft and weather changes at the earth's surface. In 1912 Dr. W. N. Shaw, director of the British Meteorological Office, introduced the idea of a "substratosphere." This he defines as "a layer of atmosphere just under the stratosphere, at the height of about 9 kilometers in the region of the British Isles, which apparently often marks the height at which the velocity of the wind is a maximum, and may be regarded as the layer of origin of the changes of pressure which are the dominant features of our weather maps." While the concluding words of the foregoing definition involve a debatable hypothesis, the notion of a transition-layer between troposphere and stratosphere seems convenient. Some characteristics of the substratosphere are discussed by Dr. A. Schmauss, director of the Bavarian meteorological service, in the current number of *Beiträge zur Physik der freien Atmosphäre*. (Bd. 6, Heft 3.)

Yet higher "spheres" than the stratosphere still belong to the realm of speculation. In 1911 Dr. Alfred Wegener suggested that the physical characteristics of a hydrogen atmosphere such as, in view of the atomic weight of this gas, may be presumed to overlie the stratum in which nitrogen prevails, would entitle it to be regarded as a distinct "shell" of the atmosphere. At greater heights he suggests

that the predominating constituent of the atmosphere may be a hitherto unknown gas, lighter than hydrogen, and perhaps identical with the hypothetical "coronium" of the solar corona. This he calls "geocoroniun," and he sees in it the origin of the most conspicuous line, hitherto unidentified, in the spectrum of the aurora. He computes that geocoroniun constitutes 0.00058 per cent of the atmosphere by volume at the earth's surface, but 93 per cent at an altitude of 500 kilometers. Thus the four shells of the atmosphere according to Wegener (2) are, in ascending order: Troposphere, stratosphere, hydrogensphere, geocoroniunsphere. Dr. O. Tetens (3), since the "auroral line" is also found in the spectrum of the zodiacal light, prefers to call the hypothetical light gas of the upper atmosphere "zodiacaon." These speculations have been recorded here at some length on account of their prominence in current literature, but it should be noted that the "auroral line," although no longer attributed to the heavy gas krypton, is still susceptible of various interpretations, and is therefore an unsafe basis for hypotheses concerning the structure of the atmosphere. L. Vegard (4), who has redetermined the position of the line by observations made at Bossekop, considers it an argon line.

Aerology has been annexed to the field of polar exploration with interesting results. Long series of upper-air soundings were made by the recent expeditions of Scott and Filchner in the Antarctic, and by Jost and Stolberg, at Godhavn, on the west coast of Greenland, in 1912-13. The latter observers sent up 120 pilot balloons, for one of which they claim the hitherto unprecedented altitude of 39 kilometers (24.2 miles) above sea level.(5) They were unable to find at any altitude evidence of a regular circumpolar whirl in the atmosphere.

A timely summary of the immense body of international kite and balloon observations was prepared by Mr. E. Gold in 1912, and has recently been published as *Geophysical Memoir No. 5* of the British Meteorological Office.

The application of aerology to the needs of the aeronaut has given birth to a new subbranch of science, "aeronautical meteorology." Its content is perhaps best represented and delimited in a very practical little work by Dr. Franz Linke, entitled "Aeronautische Meteorologie" (2 vols., Frankfurt a. M., 1911).

At the beginning of the year 1911 the world's first aeronautical weather bureau was organized in Germany. Observations of the air currents at various altitudes are made daily with pilot balloons at a score of stations scattered over that empire and telegraphed to the Lindenberg Observatory, whence bulletins are issued to all parts of the country for the guidance of aeronauts.

The measurement of solar radiation is still a capital problem, as it was five years ago. The most definite step in advance has been Abbot's redetermination of the solar constant (1.922 standard calories per square centimeter per minute at mean solar distance, with fluctuations to the extent of about 10 per cent). Abbot (6) is now endeavoring to check these results by means of observations obtained at great altitudes with sounding balloons. Much attention has recently been devoted to attempts to measure separately the kind or kinds of radiation having most influence upon plant growth and other biological processes(7).

In the field of dynamical meteorology, or atmospheric mechanics, a new personality has arisen, viz., Prof. V. Bjerknes, whose elaborate treatise on "Dynamic Meteorology and Hydrography" is in course of publication by the Carnegie Institution and who is also issuing a